

Species of Microdontomerini (Hymenoptera: Chalcidoidea: Torymidae) Associated with Galls of Cynipidae (Hymenoptera) in Europe

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Abstract.—A key is given to European species in the genera *Adontomerus* and *Idiomacromerus* that are parasitoids in galls of Cynipidae, and the known host associations of the eight species are reviewed. Two of the six species of *Idiomacromerus*, *I. silybi* Askew and *I. urospermi* Askew, are described as new, and characters separating *Idiomacromerus* and *Psenderimerus* are discussed.

A number of species of *Adontomerus* Nikol'skaya and *Idiomacromerus* Crawford, related genera within the torymid tribe Microdontomerini (Grissell 1995; Askew 2000), have been reared from cynipid galls as parasitoids of the gall-formers or possibly of other chalcid parasitoids. It is mostly galls of Aylacinae developing on herbaceous plants that are attacked, chiefly in southern Europe, and in these galls Micro-

dontomerini appear to take the place of species of *Torymus* Dalman (Torymini), which feature prominently in the parasitoid communities in cynipid galls on *Rosa* (Diplolepidini) and *Quercus* (Cynipini). We provide a key, and review the host associations of the two species of *Adontomerus* and six of *Idiomacromerus* that are parasitoids in galls of Cynipidae. Two new species of *Idiomacromerus* are described.

KEY TO EUROPEAN SPECIES OF ADONTOMERUS AND IDIOMACROMERUS PARASITIC IN CYNIPID GALLS

1. Antenna with one anellus and 7 funicle segments (with linear sensillae); basal tergite of gaster rather strongly incised medially on its posterior margin; forewing with infusate spot behind marginal and stigmal veins (*Adontomerus*) 2
- Antenna (Figs. 2, 4) with two (rarely three) anelli (lacking linear sensillae) and 6 (rarely 5) funicle segments; basal tergite of gaster weakly incised on posterior margin; forewing usually without dark spot (present in *mayri*), sometimes with a yellowish mark (*Idiomacromerus*) 3
2. Metafemur of female 2.8× as long as broad *impolitus* (Askew and Nieves-Aldrey)
- Metafemur of female very stout, 2.2× as long as broad *crassipes* (Bouček)
3. Body mainly yellow, darker dorsally but without metallic tints; head with tract of flattened, shining white scale hairs around orbit; metatibia with only one distinct apical spur (Fig. 5C); female antenna with a colourless process at apex of clava (Figs. 5A, 5B); male with relatively small eyes 4

- Body dark, metallic, with yellow colouration at most on part of gaster; conspicuous circumorbital tract of white scale hairs absent; metatibia with two apical spurs; female antenna without a colourless apical claval process; male eyes normal 5
 - 4. Ovipositor sheath almost 1.6× as long as metatibia; female gaster (excluding ovipositor) 1.6× as long as mesosoma, gaster plus ovipositor 1.8× as long as rest of body; funicle segments less compacted; larger, female body including ovipositor 3.3mm *urospermi* sp. n.
 - Ovipositor sheath about as long as, or very slightly longer than, metatibia; female gaster (less ovipositor) 1.1–1.2× as long as mesosoma, gaster plus ovipositor 1.4× as long as rest of body; funicle segments transverse and more compacted; smaller, overall length of female body 2.2mm *semiaenea* (Szélnyi)
 - 5. Antennal flagellum strongly clavate, the third segment (F1) distinctly narrower than pedicel. (Mesosoma in dorsal view relatively narrow, 1.45–1.5× as long as broad; ovipositor sheath 1.5–1.7× as long as metatibia; metafemur 3.4× as long as broad) *centaureae* (Askew and Nieves-Aldrey)
 - Antennal flagellum less clavate, F1 from almost as broad to slightly broader than pedicel 6
 - 6. Female gaster with basal tergites dorsally yellowish (mesosoma in dorsal view 1.55× as long as broad; ovipositor sheath 1.4× as long as metatibia; metafemur 2.8× as long as broad) *silybi* sp. n.
 - Female gaster entirely dark with metallic reflections on basal tergites 7
 - 7. Forewing clear; body dark bronze-green; mesosoma in dorsal view about 1.5× as long as broad; antennal funicle segments distinctly transverse. (Ovipositor sheath 1.6× as long as metatibia; metafemur 2.8× as long as broad) *papaveris* (Förster)
 - Forewing with dark mark behind marginal vein; body dark bronze with few green reflections; mesosoma in dorsal view 1.2–1.3× as long as broad; antennal funicle segments only slightly transverse *mayri* (Wachtl)
- [*I. mayri* is not known to us, its characters being taken from the literature]

Adontomerus crassipes (Bouček)

Microdontomerus crassipes Bouček, 1982

A. crassipes has been reared in Spain from galls of *Andricus kollari* (Hartig) (agamic gen.) on *Quercus petraea* and *Q. pubescens*, and galls of *Isocolus lichtensteini* (Mayr) (= *tavaresi* Nieves-Aldrey) on *Centaurea aspera* (Askew and Nieves-Aldrey 1988). The record in Askew and Nieves-Aldrey (1988) of material from the plant *Leuzea* (as *Centaurea*) *conifera* refers to the host *Isocolus leuzeae* Nieves-Aldrey; we have since obtained more specimens from this host. A male from the type series was obtained from an unidentified gall on *Centaurea sphaerocephala* in Algeria.

A. crassipes is one of the few chalcid parasitoids known to attack hosts in cynipid

galls on both oak trees and herbaceous plants.

Adontomerus impolitus (Askew and Nieves-Aldrey)

Microdontomerus impolitus Askew and Nieves-Aldrey, 1988

This species is a common parasitoid in Spain in galls of *Aulacidea tragopogonis* (Thomson) which develop concealed inside stems of *Tragopogon*. Recently we have seen many specimens reared from galls of *Aulacidea acroptilonica* Tyurebaev on *Acroptilon repens* collected in Turkey and Uzbekistan, submitted in 2003 by Urs Schaffner (CABI Switzerland).

***Idiomacromerus centaureae*
(Askew and Nieves-Aldrey)**

Liodontomerus centaureae Askew and Nieves-Aldrey, 1988

I. centaureae is so far only known as a parasitoid in galls of *Phanacis centaureae* Förster developing inside stems of *Centaurea scabiosa* in Spain. In addition to the type locality in Guadalajara, we have subsequently obtained *I. centaureae* in Cuenca from galled *C. scabiosa* collected 3.v.2002 beside the Tragacete to Uña road.

***Idiomacromerus mayri* (Wachtl)**

Lochites mayri Wachtl, 1883

I. mayri is reported to have been reared from galls of *Anlacidea scorzonerae* (Giraud) in Hungary (Szelényi 1957a; Erdős 1966) and France (Giraud and Laboulbène 1877, as *Callinome scorzonerae* nomen nudum), and *A. tragopogonis* on *Tragopogon* in Hungary (Erdős 1966). Bouček (1995) records *I. mayri* from the Czech Republic.

***Idiomacromerus papaveris* (Förster)**

Lochites papaveris Förster, 1856

Liodontomerus papaveris (Förster)

I. papaveris was described from Germany as a parasitoid of *Aylax papaveris* (Peris), and is now known to be widespread in central and southern Europe, associated with cynipid galls formed in seed capsules of *Papaver*. In addition to *A. papaveris*, host gall wasps are reported as *A. minor* Hartig and *Barbotinia oraniensis* (Barbotin); also, Szelényi (1957a) reports rearing *I. papaveris* from galls of *Xestophanes szepligetii* Balás on *Potentilla* in Hungary.

***Idiomacromerus semiaenea* (Szelényi)**

Lochitomorpha semiaenea Szelényi, 1957b

Lochitomorpha Szelényi was synonymized under *Pseuderimerus* Gahan by Grissell (1995) but Zerova and Seryogina (1999) place the present species in *Idiomacromerus*. Our reasons for following the

latter authors are explained below under *I. urospermi*. The holotype has been examined (Natural History Museum of Hungary, Budapest). We have two specimens reared from *Centaurea* stems containing galls of *Phanacis centaureae* Förster, collected in Spain (Madrid, Dehesa de Arganda, 5.x.1994, F. Ronquist), but it is not certain that they emerged from the cynipid galls.

***Idiomacromerus silybi* Askew, sp. n.**

Female.—Head and thorax green, dorsally slightly to quite strongly coppery, bronze tints on sides of thorax, not very shining; gaster with three basal tergites dull yellow, otherwise brown with very faint metallic tints, ovipositor dark brown. Head with a narrow band of shining white, flattened scale hairs on lower inner orbit. Scape testaceous ventrally and basally, dark brown in upper part; pedicel weakly metallic; flagellum brown. Legs with coxae more or less testaceous apically but otherwise dark metallic green with copper reflections; femora mostly brown; rest of legs brownish yellow with tarsal claws brown. Tegula testaceous, darker centrally; forewing clear, venation pale. Length of holotype, excluding ovipositor, 2.2mm, ovipositor sheath 0.8mm; in small specimens the overall body length is barely 2 mm.

Head in dorsal view $1.25\times$ breadth of mesoscutum, $2.2\times$ as broad as long; POL $2.4\times$ OOL, posterior ocellus separated from orbit by about $1.75\times$ its diameter. Head in front view $1.27\times$ as broad as high, malar space $0.5\times$ height of eye; torulus with ventral edge slightly above level of lower orbit; scrobes moderately deep, mesially confluent above intertorular prominence. Occiput without carina. Antenna (Fig. 2) with scape not reaching level of anterior ocellus by one major diameter of latter; length of pedicel plus flagellum $0.87\times$ head breadth; pedicel about $2.5\times$ as long as broad, almost to fully as long as first four flagellar segments, with many

short hairs; flagellum clavate with two anelli and six moderately compact funicle segments (in small specimens F1 may be scarcely longer than the second anellus, narrower than the pedicel, and apparently lacking linear sensillae); F1 from almost as broad to slightly broader than pedicel at apex, broader than long as F2–F6; clava about 2× as long as broad, apically rounded without process or spicule; linear sensillae inconspicuous in a single transverse row on each segment, hairs on flagellum short and not outstanding.

Mesosoma in dorsal view 1.55× as long as broad; pronotum with dorsal surface rounded into anterior face; mesonotum dorsally with inconspicuous, short, white pilosity, the hairs somewhat flattened (scale hairs), reticulate sculpture raised and fine; notauli complete but not deep; scutellum as broad as long; propodeum medially 2× as long as dorsellum, its anterior margin with a row of small foveae (10 in holotype) separated by carinulae, smooth and shining medially but with faint, fine reticulate sculpture laterally. Posterior leg with dorsal surface of coxa sparsely and shortly pilose; femur 2.8× as long as broad; tibia with two distinct apical spurs, the outer about half as long as the inner.

Forewing (Fig. 1) basal cell with only 1–3 hairs (excluding hairs on basal and cubital veins); speculum partially open below; lengths of costal cell: marginal vein: stigmal vein: postmarginal vein as 70:34:11:19; marginal plus postmarginal veins occupying 0.31× wing length.

Gaster (Fig. 1) (excluding ovipositor) slightly shorter than head plus mesosoma; basal tergite with posterior margin weakly incised medially; tip of hypopygium at 0.75× gaster length; ovipositor sheath 0.73× as long as rest of gaster, 1.4× length of metatibia.

Male.—Unknown.

Holotype. ♀. SPAIN, Madrid, Dehesa de Arganda, ♂ gall *Aulacidea freesei* Nieves-Aldrey in stem of *Silybum marian-*

um (L.), collected 6.XI.2002, emerged 2003 (R. R. Askew). Depository Museo Nacional de Ciencias Naturales, Madrid.

Paratypes. 2♀ ♀. Same data as holotype.

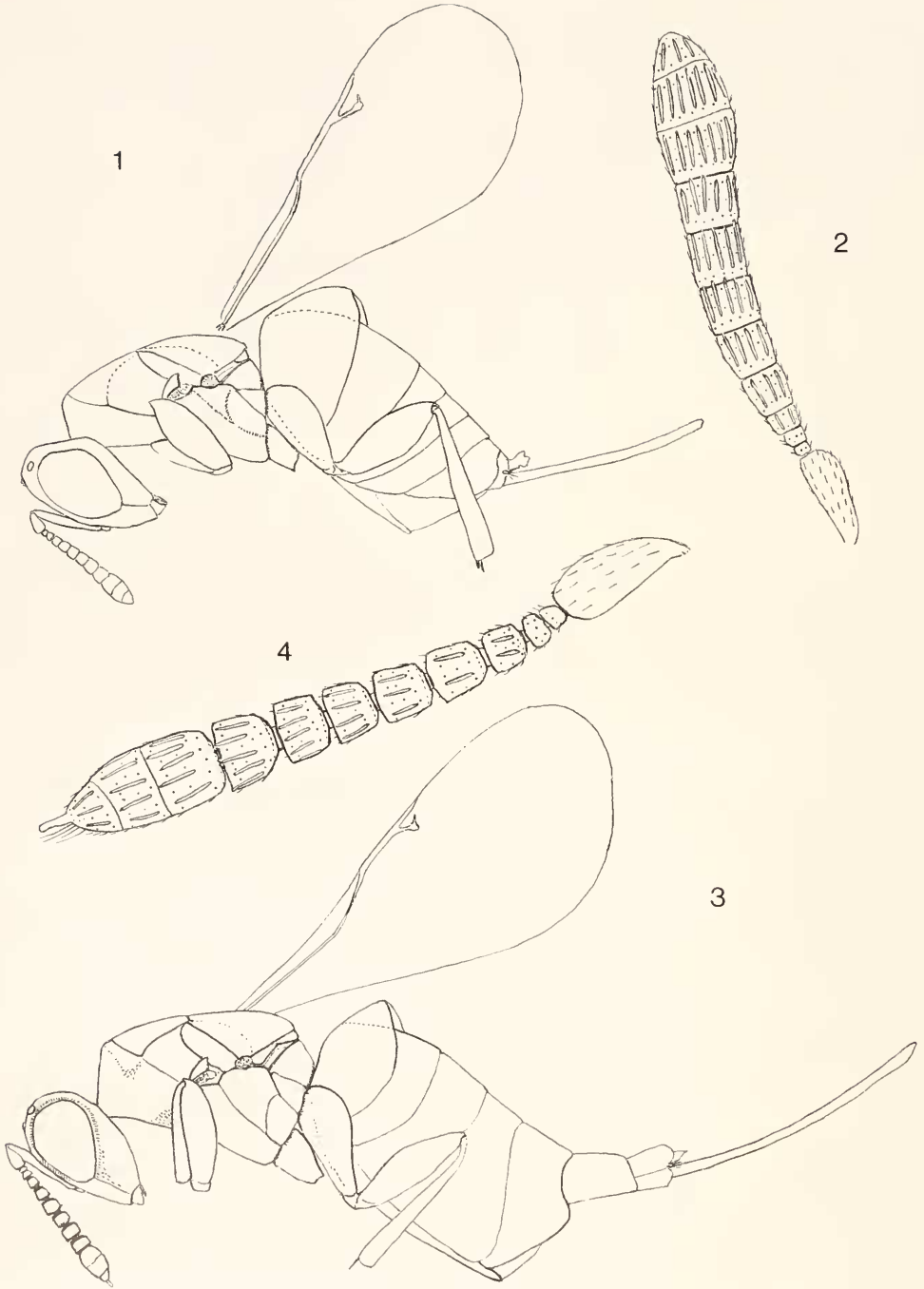
Additional material. 3♀ ♀. SPAIN, Málaga, Torcal de Antequera, ♂ stems *S. marianum* with galls of *A. freesei* or *Phanacis zwoelferi* Nieves-Aldrey, collected 17.VIII.2002 (J.L. Nieves-Aldrey).

Biology.—A parasitoid in galls of *Aulacidea freesei* (Hym., Cynipidae) developing in stems of *Silybum marianum*. Galls of *Phanacis zwoelferi* Nieves-Aldrey also develop in *Silybum* stems and it is possible that these too are attacked by *I. silybi*. The final instar larva of *I. silybi* is described below.

Comments.—*I. silybi* bears a strong resemblance to *I. papaveris* in colour and sculpturation of head and thorax, and in antennal structure and wing venation. The two species may be easily distinguished however by the extensive area of dull yellow colour on the dorsal surface of the basal tergites of the gaster in *I. silybi*, this region being entirely dark in *I. papaveris*. Additional differences are indicated in the key (above).

Final instar larva (Fig. 5D).—The last instar larva is typically hymenopteriform. It is apodous and measures about 2–2.5 mm. in length and less than 1 mm. in breadth. The colouration is whitish and the shape is cylindrical, slightly flattened dorso-ventrally, longitudinally elongated and clearly narrowed at posterior end. Tegument smooth but with rows of long, erect setae which are as long as length of one ring segment. Setae are lacking on the ventro-medial part of body. The larva possesses a distinct head and 13 body segments.

Head in anterior view (Fig. 5E) 1.2× as broad as high. Mouthparts are protruding. Vertex with at least 12 long, strong setae which are nearly as long as half the distance between the antennae. The two antennal setae are long, each situated above an antenna at a distance equal to its length. Two narrow tracts of shorter setae



Figs. 1-4. *Idiomacromerus silybi* Askew sp. n. 1) adult female, 2) female pedicel and flagellum. *I. urospermi* Askew sp. n. 3) adult female (paratype), 4) female pedicel and flagellum.

run from the vertex to near the clypeus, separated by a narrow, smooth strip. The surface of the face below and lateral to the antenna is vesiculous. Antenna are small and separated by a distance about two times as long as the distance between an antenna and the lateral margin of the head. The two genal setae are very long, extending far below the level of the mouthparts.

Clypeus indistinct, its ventral margin straight, medially bearing a pair of clypeal setae. Labrum flexed along its ventral margin and laterally with a pair of papillae. The maxillae are small and more or less triangular, bearing a pair of indistinct palps. Labium concave without visible setae or palps. Mandibles simple, each with a single, acute tooth.

Idiomacromerus urospermi Askew, sp. n.

Female.—Head and thorax dull yellowish to brown without metallic colouration, darkest on thoracic dorsum. Head with vertex and frons red-brown, shading to straw-coloured on lower face, gena and occiput; mandible dark brown, palps very pale; tracts of closely spaced, silvery white scale hairs on inner and outer orbits, intertorular prominence and area between scrobes, laterad of scrobes and in a patch between torulus and eye. Scape and pedicel red-brown; flagellum dorsally light brown, the basal two claval segments darker, flagellum ventrally straw-coloured; claval tip with a whitish digitiform extension, and tuft of dark setae (partly as described by Szélenyi (1957b) for *I. semiaenea*). Pro- and mesonota dark red-brown to chocolate coloured; sides of thorax below level of wing insertions shading to pale brownish yellow; metathorax, propodeum and gaster almost entirely yellow except for brown ovipositor sheath. Legs light brown, coxae palest and tarsal claws darker brown. Forewing with a yellowish discal area, colour deepest behind marginal and stigmal veins; venation pale.

Length excluding ovipositor 2.4mm., ovipositor sheath 1.0mm.

Head in dorsal view $1.3\times$ breadth of mesoscutum, $2\times$ as broad as long; POL $1.8\times$ OOL, posterior ocellus separated from orbit by about 2.5 diameters. Head in front view $1.35\times$ as broad as high; malar space $0.66\times$ height of eye; torulus with dorsal edge about on a level with lower orbit; scrobes deep, converging upwards so that inner margins meet about two ocellar diameters below anterior ocellus, separated by wedge-shaped prominence outlined by white scale hairs. Occiput without carina. Antenna (Fig. 4) with scape just reaching lower margin of anterior ocellus; length of pedicel plus flagellum $0.9\times$ head breadth; pedicel $2\times$ as long as broad, longer than the combined length of the basal three flagellar segments; flagellum strongly clavate, first two segments anelliform, transverse, without linear sensillae; third flagellar segment (first funicle, F1) about as broad as pedicel at apex and slightly broader than long, about $2\times$ as long as second anellus; following funicle segments progressively broader and slightly longer, separated by short petioles and not compacted, F6 $1.7\times$ as broad as F1; clava slightly less than $2\times$ as long (excluding apical process) as broad, the digitiform apical process only slightly shorter than third claval segment (Fig. 5A) and situated above a tuft of long setae which each terminate in a short filamentous process (Fig. 5B); linear sensillae distributed on flagellum as in Figure 4.

Mesosoma in dorsal view $1.55\times$ as long as broad; pronotum with anterior face angularly separated from dorsal face, the latter with dense vestiture of relatively long, white scale hairs; mesonotum dorsally with shorter white scale hairs, very fine reticulate sculpture, lustreless, notauli deep, scutellum $1.1\times$ as long as broad; propodeum medially $2\times$ as long as dorsellum, its anterior margin with short carinae separating small foveae behind dorsellum. Legs with metacoxa pilose on

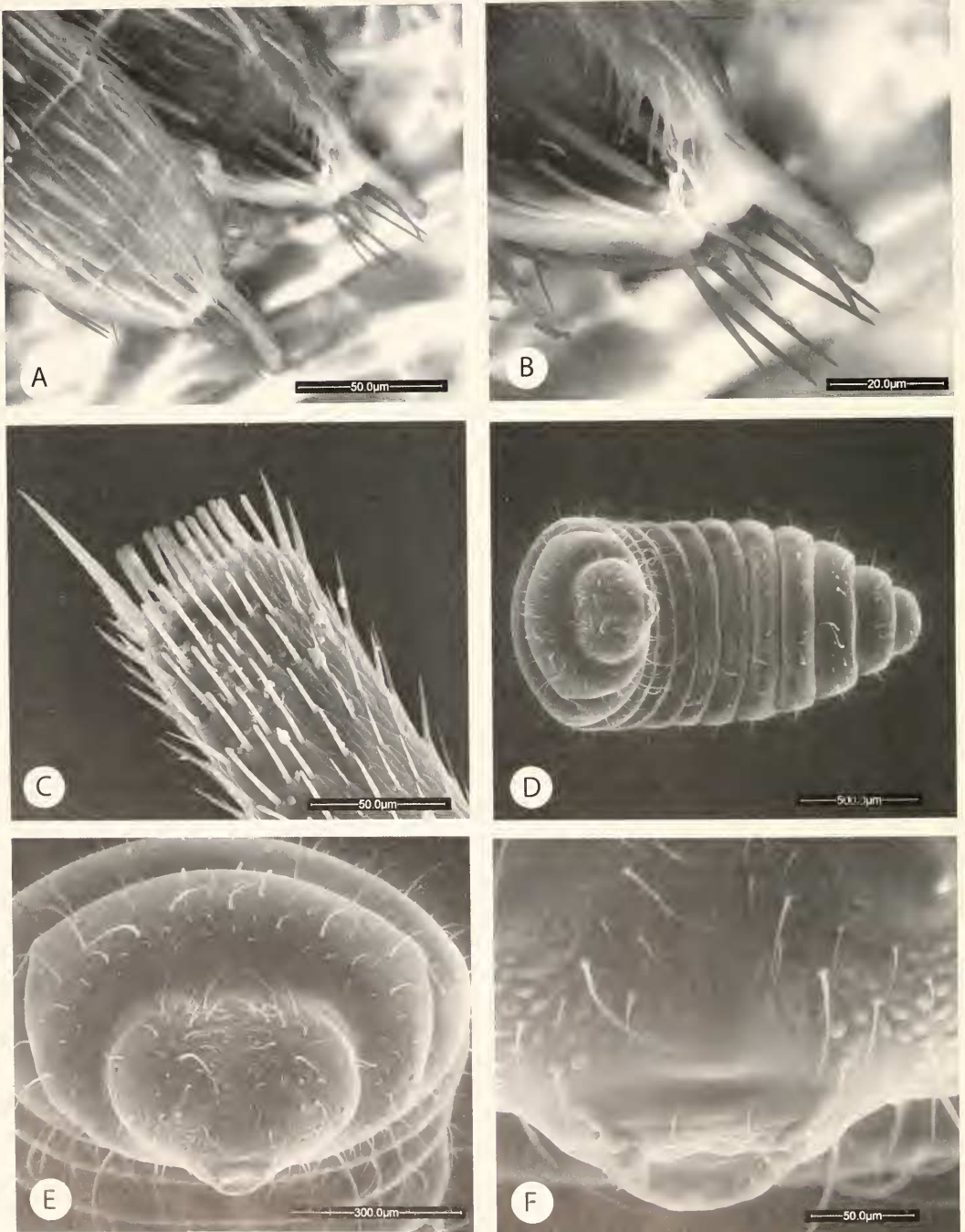


Fig. 5. *Idiomacromerus urospermi* Askew sp. n. adult female A) second and third claval segments of both antennae, B) apex of left clava, inner aspect, C) apex of metatibia. *I. silybi* Askew sp. n. final instar larva D) ventral view, E) head and first body segment, anterior view, F) oral region.

dorsal surface; femora rather stout, the metafemur almost $3\times$ as long as broad; metatibia with only one apical spur (Fig. 5C).

Forewing (Fig. 3) with basal cell pilose but hairs pale and difficult to see; relative lengths of costal cell: marginal vein: stigmal vein: postmarginal vein as 82:32:9:16; marginal plus postmarginal veins occupying $0.25\times$ wing length.

Gaster (Fig. 3) excluding ovipositor $1.25\times$ as long as head plus mesosoma; basal tergite with moderate incision medially on posterior margin; tip of hypopygium at $0.6\times$ gaster length; ovipositor sheath $0.75\times$ as long as rest of gaster and $1.58\times$ length of metatibia.

Male.—Unknown.

Holotype. ♀. SPAIN, Malaga, Casares, ex gall of *Timaspis urospermi* Kieffer in stem of *Urospermum picroides* (L.), collected 20.viii.2002, emerged 16.ix.2003 (J. L. Nieves-Aldrey). Deposited in Museo Nacional de Ciencias Naturales, Madrid.

Paratype. 1♀. Same data as holotype except date of emergence ix.2002.

Additional material. 1♀. Same data as holotype except emergence date x.2002. This specimen was lost in a car theft.

Biology.—All known specimens were reared from galls of *T. urospermi* (Hym., Cynipidae) in stems of *Urospermum picroides*.

Comments.—*I. urospermi* is closely allied to *I. semiaenea* (above) and these species are distinguishable from other *Idiomacromerus* associated with cynipid galls by the body being extensively reddish yellow to red-brown, darker on dorsal surface, and dull with very fine reticulate sculpture. There are several areas of silvery white scale hairs, these being especially apparent in an almost complete circumorbital ring. The antennal clava bears a white apical process and the metatibia has only one apparent apical spur. These two latter features are characters of the genus *Pseuderimerus* Gahan, but *I. urospermi* and *I. semiaenea* more closely resemble other species

of *Idiomacromerus* than they do Palaearctic *Pseuderimerus*. In the European *P. luteus* Bouček the spicule at the tip of the antennal clava appears to be of different structure to that of *I. urospermi* and *I. semiaenea*, the eyes and ocelli of female *P. luteus* are small (height of eye slightly less than length of antennal scape, posterior ocellus separated from adjacent orbit by about three ocellar diameters; in female *Idiomacromerus* the eye is longer than the scape and the posterior ocellus is separated from the orbit by scarcely twice its diameter), and *P. luteus* is entirely pale yellow without a vestiture of white scale hairs. We therefore follow Zerova and Seryogina (1999) in regarding *I. semiaenea* (and *I. urospermi*) as species of *Idiomacromerus* rather than *Pseuderimerus*.

I. urospermi is distinguished from *I. semiaenea* by its relatively longer ovipositor and gaster, and longer antennal flagellum, as detailed in the key.

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